

The Electronic Toolkit: Providing View-Based Reference Materials

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As web-based medical record systems are being developed and deployed, clinicians are quickly seeing a need for true point-of-care clinical reference materials. Intranet sites hosting medical knowledge resources can supply the information, but their hierarchical (location-centric) paradigms do not support a true point-of-care philosophy. We propose a model for a "view-based" repository that would provide tight integration of the web-based medical record with the point-of-care information required by clinicians.

INTRODUCTION

The MINDscape¹ is the University of Washington's web-based interface to patient records. It provides a tightly integrated interface to diverse sources of clinical information, including patient-specific data (electronic medical record), as well as medical knowledge resources. Many of these knowledge resources are served from departmental servers in remote locations. It is in the integration across departmental hierarchies where the unified healthcare approach begins to break down. The electronic toolkit is an attempt to break data repositories out of the location-based (departmental hierarchies) structure and put them into a model that allows data to be accessed on a view-based (integrated point-of-care) need.

A LOCATION-CENTRIC ARCHITECTURE

An architecture is defined as a method or style of constructing something to serve a well-defined purpose. Therefore, a website with a location-centric paradigm builds its structure on the theory of "Where is this information kept?" This type of organization is favorable for both the user and the administrator because each item has its place within the hierarchy, making it easy to search and maintain. Clinicians, however, require the integration of patient data and reference material during the decision making process at the point-of-care. Unfortunately, the model begins to break down when information managed by different parts of the hierarchy must be used in tandem. For example, while caring for a patient with asthma, the clinician at the time of the visit may want to see the local guidelines for treatment, locate and print the patient education leaflet, and order a prescription of albuterol tablets from the pharmacy. In the hierarchical environment, the physician would have to enter the "UW Medical Center" site and locate the asthma guideline. Patient leaflets might be found on a sub-specialist's

departmental server, while the pharmacy might be a logical place to find drug and formulary information. This method of traversing data is typical and unique to location-based systems.

A VIEW-BASED ARCHITECTURE

A view-based architecture is centered around a situation rather than a location. A user would ask the system, "What data do I need to solve this problem?" rather than "Where do I go to get the information?" The server would respond by returning all of the information that might be useful in that circumstance. For example, a clinician has diagnosed a patient with asthma (the situation). The server returns information useful to the clinician for this circumstance such as clinical guidelines for asthma, patient education leaflets, MEDLINE search results, and links to asthma resources available on the world wide web. To provide further structure, the view would also rank the information by importance and the level of confidence (sanctioned by the medical center, housed in a department of the university but not approved by the medical center, or not reviewed) in the information.

CONCLUSION

The need for highly-integrated medical systems is producing a great need for view-based resource systems. However, because any one piece of data may be re-used in thousands of different situations, the hierarchical lines of structure begin blur and pieces of information can no longer be logically placed in one location of a hierarchy, making it virtually impossible to maintain in large-scale medical environments. The IAIMS Program at the University of Washington has built and fostered development of medical resources and is in the process of building a structure capable of supporting a view-based architecture required for integration with the MINDscape database.

References

1. Tarczy-Hornoch P, Kwan-Gett TS, Fouche L, Hoath J, Fuller S, Ibrahim KN, Ketchell DS, LoGerfo JP, Goldberg HI. Meeting clinician information needs by integrating access to the medical record and knowledge resources via the web. *JAMIA, Fall Symp Suppl*, 1997